



ADMINISTRATION REPORT

OF THE

PUBLIC WORKS DEPARTMENT,

(BUILDINGS AND ROADS BRANCH,)

BOMBAY PRESIDENCY,

FOR THE YEAR

1881-82.

Komhar.

PRINTED AT THE GOVERNMENT CENTRAL PRESS.

1882.

d with financial assistance f
Government of Maharashtra
on 11 July 2017

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GENERAL REMARKS.

1. The entire expenditure of the year was Rs. 67,06,909 as per margin. The expen-

<i>In India.</i>		<i>Rs.</i>	diture in India was Rs. 66,92,405. In round figures, the expenditure on new Works was 20½ lakhs; on Repairs 26 lakhs; on Establishment 12½ lakhs; on Tools and Plant ½ lakh, and on Barrack Department (chargeable to Military Grant) 1½ lakhs.
Imperial	...	14,74,177	
Provincial	{ Other Public Works	28,70,462	
	{ Railways	9,971	
Contributions	...	2,62,480	
Local Funds	...	20,62,090	
Local Loans	...	13,225	
	Total	66,92,405	
In England	...	14,504	
	Grand Total	67,06,909	

I.—MILITARY.

2. The entire expenditure under the head Military was Rs. 12,26,319, of which Rs. 4,18,961 was for Original Works, and Rs. 4,77,253 for Repairs; the balance being for Establishment (Rs. 1,79,683), Tools and Plant (Rs. 11,718), and Barrack Department (Rs. 1,38,704).

I.—FORTIFICATIONS.

3. Corrugated iron coverings on wrought-iron framing were constructed on the four batteries at Mahālakshmi, Malabār Point, Oyster Rock, and Middle Ground, with a view to protect the ordnance in them from the rain during the monsoon.

II.—CANTONMENTS.

4. The tree planting in the neighbourhood of the barracks, &c., at Colāba commenced last year was completed.
5. The improvement of the road at the Hadjāff or Little Paas at Steamer Point, Aden, was in progress during the year.
6. Gutters were constructed in the Sadar Bāzār at Poona as part of a general scheme of surface drainage.
7. Slaughter gallows for sheep and oxen were erected at Poona, under tiled-roof and over-paved platforms, with water laid on.

III.—ACCOMMODATION FOR TROOPS.

8. The armourer's shop for the European Infantry at Poona, mentioned in last year's report, was completed and handed over to the Military authorities; and water pipes have been laid to all the officers' quarters at Upper Colāba, Bombay, so as to give a supply of Tulsī water in lieu of that drawn from wells, which was both inadequate and of doubtful quality.

9. The work of enlarging the Military Prison at Poona, described in last year's report, was completed within the estimate; the enlargement of the Canteen in the Wanowrie Lines was also completed, and handed over to the Military authorities for use; a new quarter guard and cells for a Regiment of European Infantry was erected at Wanowrie on the standard plan; and certain improvements effected to the Barracks and Pacheries at Ghorpuri.

10. The erection of a hospital for British Troops at Ahmedabad was sanctioned by Government at an estimated cost of Rs. 1,78,994, and work commenced in November 1881, but was shortly after stopped by the Military authorities on the ground of its location at a less distance than 800 yards from the Fortified Post; and work was only resumed recently. The hospital and subsidiary buildings will afford the following accommodation: seven wards to accommodate 34 patients, lavatories and latrines, surgery, receiving room, store-rooms, day-room, Hospital Sergeant's, Assistant Apothecaries' and Apprentices' quarters, attendants' rooms, sculleries, matron's quarters, dead-house, laundry, native latrine with water tower, and servants' quarters, &c.

11. The improvements to the troop siding at Devlali were completed during the year under review, by the G. I. P. Railway Company.

12. Additions and alterations were effected to the old Royal Artillery Barracks at Kolhapur, and certain new semi-permanent subsidiary buildings constructed for a detachment of 100 men of British Infantry temporarily located at that station.

13. The range of 26 married soldiers' quarters in the Napier Lines at Karachi was converted into 13 quarters for Warrant officers; at Jask the work of raising the roof of the Native Infantry Pendalls, improving the ventilation, adding verandahs and building latrines has been in progress; new pendalls are being built for a Native Infantry Regiment at Jacobabad.

14. The recreation room and theatre for European troops at Steamer Point, Aden, described in the previous report, have been completed; Lines for the Sappers and Miners at the same place were in progress; and the male and female wards of the European Infantry Hospital at the Crater were re-built.

IV.—ORDNANCE.

15. At Bombay, quarters were built for 16 store lascars at Sewri; various additions were made in the Arsenal, and two bungalows for Warrant officers of the Ordnance Department with out-buildings constructed on the Esplanade. The works in the Arsenal at Karachi, described in last year's report, were completed, the whole being now in working order.

16. A project, amounting to Rs. 3,21,982, for erecting a fortified position at Ahmedabad, consisting of a magazine 95' x 24'-6", to contain 100,000 lbs. of powder, surrounded by a masonry wall 8' high; a ball ammunition room 40' x 20'; shifting room 20' x 15'; workshop; guard-room with 8 beds for European, and 12 beds for Native, guards; European and native prisoners' rooms; lavatories and latrines; native officers' room; water-ruoh; gunshed to accommodate 30 guns and wagons; Commissariat office to afford accommodation to the Executive Commissariat Officer and his establishment, near the existing Commissariat Stores, was sanctioned in 1880, but some lengthy correspondence ensued as regards the bomb-proof qualities of the roof of the Powder Magazine, and it was not till May 1881 that it was decided that it would be sufficiently bomb-proof with the addition of earth being placed on the vaulted roof if deemed necessary, when tenders were invited and submitted to Government, and work put in hand in September 1881.

17. The lightning conductors of the Powder Works buildings at Kirkee were made more efficient by the use of Sanderson's patent copper continuous conductors. The Expense Magazine at Devlali alluded to in last year's report was completed.

V.—COMMISSARIAT.

18. No new works of this class were undertaken during the year under review, and the works at Aden, Baroda, Ahmedabad, Karachi, Belgaum, and Poona, described as being in progress in the previous report, were completed during the year.

VII.—STAFF.

19. Huts with servants' quarters were built for infectious disease cases at Steamer Point, Aden.

IX.—NAVAL AND MARINE BUILDINGS.

20. Under this head there were only two works undertaken during the year at Bombay, viz., paving the floors of the godown, and converting into a sail loft a lumber room in the Dockyard.

II.—CIVIL BUILDINGS.

21. The expenditure under this head was Rs. 15,06,079, Rs. 7,14,398 being for Original Works, and Rs. 4,37,688 for Repairs; the balance being for Establishment (Rs. 3,49,144) and Tools and Plant (Rs. 5,449).

I.—REVENUE.

22. All the works in connection with the Salt Department mentioned in last year's report were completed, and the construction of a Custom House at Málvan was commenced during the year under review. Quarters for the Superintendent, offices, and quarters for the Salt Establishment at Moach, were built at Karáchi, and a scheme for supplying drinking water to the establishment employed on the works was completed. A trauway and water-supply works in connection with the extension of the Khárághoda Salt Works to Uru are in progress.

23. The additions and alterations to increase the accommodation in the Collector's Kacheri at Poona were completed.

24. The Mámlatdárs' Kacheries at Chopda in the Khándesh Collectorate, and at Devrukh in the Ratnágiri Collectorate, were completed, and a similar building at Khed has been put in hand.

III.—TELEGRAPH.

25. The only work executed under this head during the year was the renewal and tiling of the roof of the cable tank shed of the Persian Gulf Telegraph at Masora.

IV.—GENERAL BUILDINGS.

26. The works undertaken under this head consisted of alterations to the measles ward, and replacement of compound railings; improvements to the garden; removal and rebuilding of portions of the roof of the male hospital, and Surgeon's private and operating room; additional accommodation for the married hospital steward; alterations to the apothecaries' quarters; provision of a privy to the quarters occupied by the matron; and putting up of a door at the foot of the stairs leading up to the obstetric ward, in the European General Hospital, Bombay; improvements to, and extension of, the body guard lines, and decoration of the principal stair-case room in the Government House at Parel; construction of servants' and sweepers' quarters at the Sir Jamsetjee Jeejeebhai Hospital; provision of additional accommodation in the old Medical Stores building in the Fort now used as a Secretariat record-room; construction of thirty-six additional stalls in the General Mews at Bombay; additional accommodation in the Rewa Kántha Agency bungalow at Godhra; construction of a dispensary at Vajeria, and quarters for the hospital establishment attached to the Dákor Dispensary in the Kaira Collectorate; erection of a dispensary with subsidiary buildings at Sangamner in the Ahmednagar Collectorate; construction of a detached pavilion, reconstruction of three staff bungalows, and provision of a larder at Government House, Gunesh Klund, Poona; and completion of the works left unfinished during 1880-81 at Government House, Mahábaleshvar. The restoration and adaptation at Bijápúr of several buildings as residences and offices for the Collector, his Assistants, the Executive Engineer, &c., in connection with the establishment at that city of the head-quarter station of the Kaládgi District, were in progress. A dispensary was completed at Indi; and the conversion of the old Military Hospital at Dhárwár into a Civil Hospital was half-finished.

27. In Sind the works under this head were additions and alterations to the Commissioner's Printing Press, and water-supply to the Government House at Karáchi.

V.—ECCLESIASTICAL.

28. The two works under this head mentioned in last year's report, viz., the church at Malabár Hill and that in the camp at Ahmedabad, were completed; and the new works were the provision of quarters with out-houses for the Roman Catholic Chaplain at Purandhar, the construction of a Mission church at Ahmednagar (contribution work,) and the provision of a cemetery at Poona, the former of which was completed and the two latter were in progress.

VI.—EDUCATIONAL.

29. Certain fixtures were provided in, and the furniture required supplied to, the new Elphinstone High School, Bombay, which was mentioned as having been completed and handed over to the Educational Department in last year's report.

30. The quarters and out-houses for the Superintendent and Teacher of the Institution in the compound of the School of Art, the store-room, and additions and alterations to the school itself, described in last year's report, were completed during the year under review. The greater part of the furniture for the school has been supplied and the rest is in hand.

31. The building for the Alexandra Native Girls' English Institution was completed and handed over for occupation.

32. The west wing of the Cathedral High School has been completed and handed over for occupation. The central feature is approaching completion, but the east wing has not yet been put in hand, funds not being available for the prosecution of the work.

33. Stained glass windows were substituted for the venetian ones in the room over the front porch of the University Library; the Clock Tower remains incomplete pending the arrival from England of the clock and chimes. It is proposed to illuminate it by electric light at the joint expense of Government and the Bombay Municipality.

34. The original building for the school at Hānsot in the Anklesvar Tāluka having been found insufficient, another block of the same dimensions was constructed in the rear.

35. School-houses were built at Vejālpur, Ankav and Dākor, in the Kaira Collectorate.

36. The Byramji Jeejeebhoy Medical School at Ahmedabad, described in last year's report, was completed during the year under review.

37. Materials were collected with the allotment made for the year for the school-house at Kāmeri, Sātāra; an enclosure wall was built and 100 tons of moulding sand supplied for the foundry at the workshop of the College of Science, Poona. School-houses are being constructed at Kopergaon in the Ahmednagar, and at Wani in the Nāsik, Collectorates.

38. The schools in the Dhārwar Collectorate and at Bāgalkot in the Kalāḍgi Districts, described in last year's report, have been completed.

VII.—JUDICIAL BUILDINGS.

39. The foundation, plinth, and teak-wood frame work of the walling, of a new Subordinate Judge's Court-house at Vāgra in the Broach Collectorate, have been completed, and it is likely that the work will be finished very shortly. The Judge's Court-house at Devrukh, in the Ratnāgiri District, noticed in last year's report, was completed.

40. In the Kaira District, a Police Station at Limbdi for 14 men and Police Lines at Thāla for 10 men were erected, and the bungalow of the Superintendent of Police referred to in last year's report was finished and occupied in 1881-82. In the Ahmedabad Collectorate additions and alterations were made to the Barādaree Paga in the city, and the Police Lines at Dholka for 26 men referred to in last year's report were completed. At Poona the Farāskhāna of the old Boodwar Palace, formerly used as a cook-room for the Police Lock-up, has been converted into a lock-up, in lieu of the very confined and ill-ventilated place which answered the purpose before. The construction of Police Lines at Nawapur in the Khāndesh District was commenced in the latter part of the year, and is in progress. In the Belgāum Collectorate new Police Lines with auxiliary buildings were in progress, and Police Lines for 8 men and a Faujdār's office at Kalghatgi were completed. A portion of the Police Lines at Sirsi in the Kānara District was rebuilt, and Lines for 22 men were erected at Devrukh, in the Ratnāgiri District. In Sind, Police Lines were constructed at Sujāval; and similar Lines were being built at Karāchi during the year under review.

IV.—COMMUNICATIONS.

41. The total outlay on communications, including roads and bridges, was Rs. 32,00,653, of which Rs. 9,53,488 was for Original Works, and Rs. 15,92,708 for Repairs; the remainder being for Establishment (Rs. 6,42,858), and Tools and Plant (Rs. 11,599).

42. The works executed for the improvement of communications in the Presidency extended over a large area, and consisted of various items, the particulars of which are given in the Financial Accounts, and consequently need not be recapitulated here; but the following is a concise description of the more important works carried out in each district:—

I.—ROADS.

43. **Northern Konkan.**—The road from Nāgothna to Dharamtar, described in last year's report, was completed during the year under review. In 1865 a road connecting the town of Thāna with Ghodbandar was commenced, but abandoned on the completion of the first 4 miles, and now it is being extended to the Ghodbandar Creek, a distance of 2½ miles, whence access can be had by water to Ghodbandar, Baasein, &c. The Murbād-Saralgaon section of the road from Kalyān to the Mālsej Ghāt, which remained unmetalled last year, has been completed, and the total length of the line now open is 27 miles; 6 miles of the road from Kalyān to Murbād have been metalled during the year to a width of 12 feet, making a total of 15 miles metalled, leaving only 4 miles to complete the metalling of the whole road. The portions of the road over the Karli Khind which were liable to damage by heavy falls of rain were metalled. The road over the Chabed Khind referred to in last year's report has been in progress, and will be metalled and completed in the ensuing year.

44. **Surat.**—Nearly the whole of the earthwork, and all the small and large bridges and culverts, on the road from Sarat to Bārdoli in British territory, which were in progress last year, have been almost completed, the gravelling of the first two miles having been done

and materials collected for the remainder. The Foolpara-Ushwaneekoomar road, which is a continuation of the road from Surat to Foolpara, was in progress during the year. The partial drainage of the road from Olpád to Kudrama was effected, the remaining portion will be taken up as funds permit. Some improvements as regards gradients and drainage were made on the road from Bandsa to Chikhli and Ranwari.

45. **Broach.**—A proposal having been made to construct a light railway along the road from Broach to A'mod, its metalling has been definitely postponed pending the settlement of the question of laying down of the railway. The work of constructing a masonry dip 260 feet long by 20 feet broad to facilitate traffic on the Dolia Khari, a long low salt-water creek on the Jambusar and Tankária road, was nearly completed and will be open for traffic by the end of April or soon after. A paved causeway, 100' long and 18' wide with metalled slopes over the Amla Khari, has been completed on the road from Anklesar to Hānsot.

46. **Kaira.**—The work of improving and metalling the British and Bária sections of the road from Godhra to Jhálod, which form portions of line joining Jhálod with the Godhra and Dohad road, was in progress during the year under review. The other sections of this road, viz., Singapur to Jhálod and Dudhia to Singapur, have been completed. A short length of road, bridged and stone-metalled, over which heavy traffic will pass, is in progress, joining the Godhra-Dohad road with the Godhra Railway Station. A similar line, 2 miles long, has been undertaken, joining the Godhra-Bánda road with the Godhra Railway Station. The road from Páli to Bálásinor in British territory was finished in 1881-82, and is now in use. Good progress has been made in the metalling of the portion of the road from Vasad to Borsad. The construction of the road from the Barajri Station of the B. B. & C. I. Railway to Naika, the advantages of which were described in last year's report, is in progress, and its eventual extension in the direction of Dholka is regarded as likely to add largely to its value. The earth and masonry works of a road to be bridged and drained, but to remain unmetalled for the present, between the Nadiád Railway Station and the town, so that the passing of traffic through the narrow streets of the town is avoided, are in progress and will be completed in 1882-83. Materials are being prepared for bridging and draining the road from Kálol to Chámpáner, $9\frac{1}{2}$ miles in length. Sanction was accorded a few days before the close of 1881-82 to construct bridges and drains on the British section, 14 miles in length, from Godhra to Shera, of the route between Godhra and Lúnávada. It is proposed to provide a layer of six inches of stone metal for the other main road in the town of Godhra.

47. **Ahmedabad.**—The road from Sánand and Sárkhej to the Sábarmati Railway Station, described in last year's report, is still in progress; most of the materials used were got from the old Ellis bridge. A road about 18 miles long to connect the town of Dhandhuka with the Ránpur Railway Station on the Bhávnagar-Gondal Railway, was commenced two months before the close of 1881-82.

48. **Kanara.**—The Kárwár to Yellápur *via* Kygaghát section of the Malapur-Haroor road, mentioned in last year's report, was completed during 1881-82.

49. **Dhárwár.**—The Navalgund and Annigeri road, reported as nearly completed during 1880-81, was thoroughly completed, including the erection of 3 large bridges across nálas, during the year. The construction of the road from Gadag *via* Dámbal to Hesrur, 30 miles in length, work on which had been suspended in 1879, was resumed, and the section between Gadag and Dámbal has now been completed in every respect. The road between Kutmuchgi and Aligiri, $3\frac{1}{2}$ miles in length, and that between Nagasamundra and Kutmuchgi, 12 miles long, being railway feeders in connection with the Sirsi-Bádámi road, were still in progress during the year. The British portion of road, 6 miles long, between Savanúr and Lakshmeshvar was moorumed and the nála approaches sloped. Work was confined to completing the embankment on the section between Alár and Háveri of the Honávar and Samasgi road. The Annigeri section of the Dhárwár-Haliyál road was completed as designed, with the exception of metalling of a couple of miles near Dhárwár. On the unfinished portion of the Mesur-Mundargi road, between Ránebennur and Halgeri, the embankments were surfaced with moorum and nála crossings sloped. A double boat, complete, was provided, and a goods shed erected in connection with the improvements to the Tungabhadra crossing at Hesrur. The Kotkondhusi-Shirawad section of the Hubli and Agadi road was completed with culverts and drains.

50. **Kala'dgi.**—Work was confined in this District to lining out about 3 miles of road, excavating gutters, diverting nálas and collecting materials on the Bijápur-Honvád section of the Myria Bay to Sindgi road. The road from Bágalkot to Hungund in two sections was in progress, and the rest-house at the latter place completed.

51. **Ratna'giri.**—Progress is being made in the rock, earth and boulder cutting on the A'mbághát, and the whole of the road surface of the ghát will be completed before the monsoon, and the metal spread and rolled during the rains. The old road between Sakarpe and Dábbol was widened to 18 feet, balled, moorumed and rolled during the monsoon. Considerable improvements were effected on the road from the top of the Dábbol Ghát to Páli.

52. **Sa'ta'ra.**—The improvements to the Mulharpeit-Pandharpur road, referred to in last year's report, were completed, with the exception of parapets and wing-walls and approaches

in mile No. 21. Culvert No. 58 and road drains were completed on the Karád-Tásgaon road during the year 1881-82. The Nahavighát road has been completed, and is in good order. Twelve drains, filling in of approaches and mooruming road surface are in progress on the Peth-Sángli road, which has been considerably improved. The improvements of the Shergaon-Khind works were being continued and the ghát has been greatly improved. Improvements were also effected on the Salpeghát on the old Sátára-Poona road.

53. **Poona District.**—A cleared road has been constructed from Woda to Bhorgiri. On the Khed-Bhindashankar road the track has been improved and nála crossings provided with dips, &c., and it has been continued to Khed from Woda.

54. **Ahmednagar.**—Improvements in the way of constructing small masonry works and supplying metal were effected on the Paithan road. The section of road between Rájur and Bári of the Loni-Bári road was still in progress during the year under report. The following works were also in progress in this Collectorate: improvements to the road from Sangamner to Kalas; construction of feeder roads from (1) Shrigonda to Pimpri, (2) Belwandi village to the Nagar and Dhond road, (3) village of Wámbari to the Wámbari Railway Station, (4) Rahatta to Ekruk to join the Railway Station at Chibuli or Puntámba, (5) Loni to the Belápúr Railway Station, (6) Belápúr town to the Belápúr Railway Station.

55. **Na'sik.**—On the Násik-Dindori and Kalvan road, noticed in last year's report, work has been carried as far as mile 32, and the rock cuttings and embankments up to the top of the Iwat Bári Ghát nearly completed. The greater portion of the Ubada Bári-ghát road has been put in proper order and the whole will be opened for traffic after the monsoon of 1882-83.

56. **Khandesh.**—The road from Jalgaon to Dharangaon has been completed with bridges and drains for seven miles, and an embankment of earth laid for 4½ miles more.

II.—BRIDGES.

57. **Surat.**—A new bridge of 180 running feet of waterway with 10' roadway has been constructed in lieu of the old rickety Wanki timber bridge on the Bulsár and Tithal road. Extra waterway having been found necessary on the 1st mile of the road from the Kim Railway Station towards Turkesar, a timber top bridge of 25 feet span was constructed over a nála.

58. **Broach.**—A timber bridge of 5 spans of 18' feet each was built, during the year under report, over the Khadvi Nála on the road from Jambusar to Tankária, and traffic now passes over it.

59. **Kaira.**—Work was done in the construction of two masonry bridges over the Vakadi and Dohi rivers on the road from Godhra to Jhálad, and it is hoped that both bridges will be ready for traffic before the rains of 1883.

60. **Ahmedabad.**—The restoration of the bridge over the Utávly River at Walla, on the Godhra and Dhandhuka road, described as in progress in 1880-81, was completed during 1881-82 and was thrown open for traffic on the 15th August 1881. The old bridge across the Dureed Creek, on the same road, having been washed away owing to deficient waterway, a new bridge of 8 spans of 20 feet each in the clear was commenced in January last and is in progress.

61. **Kanara.**—The bridge over the Birchí River noticed in last year's report was completed. The construction of bridges at Benihalla on the Dhárwár and Kunata road, and over the Unji Nála on the road from Kádra to Shetowna, were in progress during the year 1881-82.

62. **Dhárwar.**—In this Collectorate a bridge of 3 spans of 20' each, with masonry piers and timber superstructure, was built over the Bhorkundi Nála on the Dhárwár and Tenái Ghát road, and the first coffer dam of the foundations of a bridge over the Benihalla at Navalgunnd completed.

63. **Ratnágiri.**—A bridge consisting of 3 spans of 20' each was built up to springing over the Golowli Nála on the Ratnágiri and Chiplán road.

64. **Sátára.**—The bridge over the Várna River, described in last year's report as nearly completed, was opened for traffic in June last. A foot bridge across the Yenna river at Medha was in progress, and will be completed shortly. The superstructure of stone and lime masonry for holding the standards of the flying bridge at Bhilowdi has been completed during 1881-82.

65. **Karachi.**—An iron girder bridge of 3 spans was commenced and nearly completed over the Western Nára, near Bahawalpur, on the road from Johi to Dádu, and a similar bridge was completed over the Nurwáh on the road from Sulji Station to the ferry, during the year under report.

66. **Hyderabad.**—An iron rolled girder bridge of one span was completed over the Nasrat, in the Kandiaro Táluka, and a similar one commenced and partially completed over the Guni at Natali.

67. **Shikar'pur.**—A brick masonry bridge over the Kudanwáh on the Kakar and Sita road was completed, and materials for two similar bridges over the Sháh Hamir on the road from Lárkhána to Rato-dero and Sojáwal collected during 1881-82.

68. **Jacobabad.**—Small culverts were completed on the Goránári, Thal-Garhi Yásin, Jacobabad-Tangwáni roads.

RAILWAY SURVEYS.

69. An outlay of Rs. 9,971 (debited to Railways, Provincial,) was incurred in surveying lines of Railway from Surat to Bárdoli, and thence to Soughad; and from Broach to Jambusar; but as the progress made with these has been detailed in the Administration Report of the Railway Department, no mention thereof need be made in this review.

V.—MISCELLANEOUS PUBLIC IMPROVEMENTS.

70. Under this head the total expenditure was Rs. 7,50,062, of which Rs. 5,46,053 was for Original Works, and Rs. 98,927 for Repairs; the balance being for Establishment (Rs. 99,486) and Tools and Plant (Rs. 5,596).

I.—MUNICIPAL WORKS.

71. **Bombay.**—A portion of the reclaimed land opposite the Marine Lines station having suffered considerable damage caused by the sea during the rains of 1881, has been protected by a new staging work 633 feet in length.

72. **Northern Konkan.**—New markets, consisting of two buildings, each 84 feet in length by 40 feet in width, covered with Mangalore tiles over teak planking and parlins, supported on masonry walls at each end and intermediate cast-iron pillars, and ornamental spandrills in seven bays of 12 feet each, with asphalte flooring, and stone coping over plinth, have been commenced in the town of Thána during the year and are in progress.

73. The works in connection with the project for the supply of water to the town of Thána from the Pokran spring, fully described in last year's report, were completed, and opened by His Excellency the Governor on the 18th August 1881, water being supplied to some parts of the town in July of the same year.

74. The work in connection with the water-supply in the old Bund Valley at Mátherán, also fully described in last year's report, was completed during 1881-82, but an excess expenditure of Rs. 7,641 over the original estimate of Rs. 26,615 was incurred, as the nature of the rock found under a portion of the retaining wall necessitated an additional average depth of 12 feet. Now the fixing of the railings only remains to be done.

75. A project for supplying the town of Roha, in the Kolába Collectorate, with water, at 14 gallons per head, from a perennial spring in the hills, situated 5 miles away from the town, was sanctioned for Rs. 29,995 in July 1881. The water flows down the rocky bed of a small nála, and for the rest of the distance is conveyed by stoneware piping to a masonry service reservoir, whence it is conducted to the town by cast-iron piping. At present, owing to the want of funds (Municipal,) the water is delivered at a temporary hydrant at a point 2,000 feet short of the town.

76. **Kaira.**—All the wells in connection with the water-supply of this district, noticed in last year's report, have been completed. The improvements to the tanks have made progress and will be completed in the current year.

77. **Kala'dgi.**—The work of restoring the Bezam Tank was completed, with the exception of the clearance of the old aqueduct and the distribution arrangements; and the improvements to the Tolamati Tank are nearly completed.

78. **Dha'rwar.**—Improvements were effected to the tanks at Navalgund, Jugapur and Hanshikati.

79. **Sa'tara.**—The scheme for supplying the town of Sátára with water from a reservoir at Khas, a full description of which was given in last year's report, was in progress during the year under review: the extent of work done has been described in the Administration Report of the Irrigation Department.

80. **Kha'ndesh.**—The works in connection with the construction of a well at Taloda were completed during 1881-82.

II.—HABOUR IMPROVEMENTS.

81. **Karachi Harbour Works.**—The maintenance and repairs of the Manora Breakwater have, from the beginning of the year under report, been transferred to the Karachi Harbour Board. It may, however, be mentioned that the work stood the south-west monsoon of 1881 without material injury, as it has now done for seven successive monsoons, during which time the cost of repairs has averaged only $\frac{1}{4}$ per cent. per annum on the first cost of the Breakwater. This has been mainly expended in gradually adding a concrete capping to make up for settlement, which still continues slightly, on the outer half length. The opening of the centre joint for two short spaces in the length has not increased, and here the slanting capping mentioned in last year's report appears to have answered its purpose, and is being continued as funds admit.

82. The Protection of Manora Point, so far as sanctioned, was completed by the 31st March, the design having been modified as approved by Government to meet the requirements of the Defence Committee, so far as practicable, without increase of total cost, by the substitution of a scarp for the slope at first sanctioned. The work executed during the two previous seasons stood the sea well, and that portion of the cliff extending from the Breakwater for a distance of 226 yards along the sea face of the Point may now be looked on as effectually protected, at a cost of Rs. 96,583, of which Rs. 24,802 was expended in 1881-82. No sanction has as yet been given to the protection of the further length of 275 yards indicated by the Defence Committee, and estimated at Rs. 1,09,043, on which however, some saving could probably be effected, judging from the experience of the portion executed.

83. The dredging of the harbour was for the fourth year carried on under the annual grant of one lakh, inclusive of establishment; 19,160 tons were dredged in rectification of the Entrance Channel and 210,496 tons within the harbour. Of this last 37,119 tons were dredged in the Manora anchorage, 166,760 tons in the Keamari anchorage, and 6,617 tons in the lower end of the "New Channel" for diversion of Chinna Creek waters. The average cost of the dredging was $5\frac{1}{2}$ annas per ton—a high rate—owing to the deficiencies of the new Dredger "Nearchus." These have been fully reported on, and additional dredging power has recently been acquired in the shape of the Dredger "Albuquerque," which the Madras Government had on sale at Bombay. This vessel having been paid for from Imperial funds, has been transferred without any fresh outlay, except the cost of her navigation from Bombay to Karachi and of lengthening her bucket ladder for deeper dredging. The booked expenditure during the year on "Dredging of the Harbour" was Rs. 90,226, which included outlay on enlarging the Repairing Dock, and on the quarrying from Deep Water Point by the divers of 520 tons of rock which were deposited in the West Training Groyne.

84. The cost of the harbour surveys (except fixed Public Works Department Establishment) is now borne by the Karachi Harbour Board, but the usual survey of January 1882 shows a fair continuance of improvement, though not so marked as it might have been had better dredging power been available, or had means been forthcoming to remedy the evils caused by the obstruction of "Deep Water Point" and the abrupt ending of the East Pier.